

## CLAIMS

What is claimed is:

- 1 1. A method, comprising:  
2 applying an adhesive gel material to at least a portion of a first side of a  
3 semiconductor wafer having first and second sides;  
4 positioning the semiconductor wafer on to a platform with the first side  
5 facing the platform and with the adhesive gel material between the first side and  
6 the platform to allow the adhesive gel material to hold the semiconductor wafer to  
7 the platform;  
8 grinding the second side of the semiconductor wafer; and  
9 allowing the adhesive gel material to release the semiconductor wafer  
10 from the platform.
- 1 2. The method of claim 1 wherein allowing the adhesive gel material to hold  
2 the semiconductor wafer to the platform comprises using an adhesive property of  
3 the adhesive gel material to hold the semiconductor wafer to the platform.
- 1 3. The method of claim 2, wherein the platform includes a vacuum, and  
2 wherein using the adhesive property to hold the semiconductor wafer to the  
3 platform includes holding the semiconductor wafer in position using the adhesive  
4 gel material with the vacuum substantially turned off.
- 1 4. The method of claim 2 wherein using the adhesive property to hold the  
2 semiconductor wafer to the platform includes providing substantial surface  
3 contact between the adhesive gel material and the first side of the wafer.

1 5. The method of claim 1, wherein allowing the adhesive gel material to  
2 release the semiconductor wafer from the platform includes applying a vacuum to  
3 the gel material to substantially pull the adhesive gel material off the first side of  
4 the semiconductor wafer.

1 6. The method of claim 1 wherein applying the adhesive gel material to at  
2 least a portion of the first side of the semiconductor wafer includes applying the  
3 adhesive gel material to an upper surface of an un-diced semiconductor wafer.

1 7. The method of claim 6, further comprising after grinding the second side of  
2 the semiconductor wafer, which comprises a lower surface of the semiconductor  
3 wafer:

4 washing the semiconductor wafer;  
5 mounting the semiconductor wafer; and  
6 dicing the semiconductor wafer.

1 8. The method of claim 1, wherein applying the adhesive gel material to the  
2 first side of the semiconductor wafer includes applying the adhesive gel material  
3 to an upper surface of at least a partially-diced semiconductor wafer.

1 9. The method of claim 8, further comprising after grinding the second side of  
2 the semiconductor wafer, which comprises a lower surface of the semiconductor  
3 wafer, mounting the semiconductor wafer that has had its lower surface grinded.

1 10. The method of claim 1, wherein applying the adhesive gel material to the  
2 first side of the semiconductor wafer includes applying the adhesive gel material  
3 to an upper surface of a flip chip bump wafer or non-bump wafer

1 11. The method of claim 1 wherein applying the adhesive gel material  
2 includes applying a gel material including semi-solid particles.

1 12. The method of claim 11 wherein allowing the adhesive gel material to  
2 release the semiconductor wafer from the platform includes applying a vacuum to  
3 draw the membrane away from the first side of the semiconductor wafer

1 13. The method of claim 1 wherein applying the adhesive gel material to the  
2 first side of the semiconductor wafer includes applying the adhesive gel material  
3 to an upper surface of a semiconductor wafer having surface structures.

1 14. The method of claim 13 wherein the surface structures include bumps.

1 15. The method of claim 13 wherein the surface structures include electronic  
2 circuitry.

1 16. A method, comprising:  
2 applying a gel material to a first side of a semiconductor wafer, having first  
3 and second sides, to provide substantial surface contact between the gel  
4 material and surface structures on the first side;  
5 placing the wafer on a vacuum chuck with the gel material between the  
6 wafer and the vacuum chuck;  
7 grinding the second side while using the gel material to hold the wafer  
8 against the vacuum chuck; and  
9 removing the wafer from the vacuum chuck by reducing surface contact  
10 between the gel material and the surface structures.

1 17. The method of claim 16, wherein applying the gel material to the first side  
2 of the semiconductor wafer includes applying the gel material to a surface of at  
3 least one of a flip-chip bump wafer and a non-bump wafer.

1 18. The method of claim 16 wherein the surface structures comprise  
2 electronic circuitry.

1 19. The method of claim 16 wherein the surface structures comprise bumps.

1 20. The method of claim 16 wherein reducing surface contact between the gel  
2 material and the surface structures includes activating the vacuum chuck.

1 21. The method of claim 16 wherein the gel material includes semi-solid  
2 particles.

1 22. The method of claim 16 wherein applying the gel material to the first side  
2 of the wafer includes applying a semi-solid material to an upper surface of the  
3 wafer, the semi-solid material capable to be prevent substantial collapse of a gel  
4 membrane of the gel material into the vacuum chuck.

1 23. The method of claim 16, further comprising after removing the wafer from  
2 the vacuum chuck:

3 washing the wafer;  
4 mounting the wafer; and  
5 dicing the wafer.

- 1    24.    The method of claim 16, further comprising dicing the wafer before  
2    applying the gel material to the first side of the wafer.
- 1    25.    The method of claim 24 wherein the wafer is diced to a depth deeper than  
2    a final desired depth of the wafer.
- 1    26.    The method of claim 16, further comprising using a vacuum transfer  
2    device to transfer the wafer from the vacuum chuck onto a surface for mounting.
- 1    27.    The method of claim 16 wherein grinding the second side of the wafer  
2    while using the gel material to hold the wafer against the vacuum chuck includes  
3    absorbing at least some of a grinding force applied to the second side of the  
4    wafer.
- 1    28.    A material, comprising:  
2            an adhesive gel material;  
3            semi-solid particles within the adhesive gel material; and  
4            wherein the adhesive gel material forms a membrane surface to hold a  
5    first side of a semiconductor wafer to a surface of a vacuum chuck during wafer  
6    grinding of a second side of the semiconductor wafer.
- 1    29.    The material of claim 28 wherein the semi-solid particles within the  
2    adhesive gel material form a structure to substantially prevent the membrane  
3    surface from collapsing to the surface of the vacuum chuck when the vacuum  
4    chuck is activated.

- 1 30. The material of claim 28 wherein the semi-solid particles within the
- 2 adhesive gel material includes organic particles.